

HAZARDOUS SERIES HD20

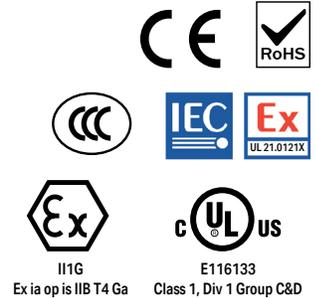
NorthStar™ brand

Hazardous Duty Encoder

Key Features

- Size 20 Encoder with Single or Dual Isolated Outputs
- ATEX, UL and IECEx Certified for Hazardous Duty Applications
- Unbreakable Code Disc up to 9,000 PPR
- Special Housing and Seals for IP67 Rating
- Anodized Aluminum, Stainless Steel, or Nickel Plated Housing

HAZ
Hazardous Duty



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical
Resolution: 1 to 9,000 PPR (pulses/revolution)
Format: Two channel quadrature (AB) with optional Index (Z), and complementary outputs
Phase Sense: A leads B for CCW shaft rotation viewing the shaft end of the encoder
Quadrature Phasing: 90° ± 30° electrical
Symmetry: 180° ± 25° electrical
Index: 180° default gated to B low
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

ELECTRICAL

Input Power: 5VDC, 7-26VDC
Outputs:
 2N2222 Open Collector: 250mA, sink max
 7272 Push-Pull: 40mA, sink or source
 7272 Differential Line Driver: 40 mA, sink or source
 7273 Open Collector: 40mA, sink max
Frequency Response: 200 kHz (data and index)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Reverse polarity and short circuit protected on all models and short circuit protected on 7272 and 7273 line drivers only
Termination: 6, 7, or 10 pin MS Connector; Cable exit with seal
Mating Connector:
 6 pin, style MS3106A-14S-6S (MCN-N4);
 7 pin, style MS3106A-16S-1S (MCN-N5);
 10 pin, style MS3106A-18-1S (MCN-N6)
 10 pin, NEMA4 style (MCN-N6N4)

MECHANICAL

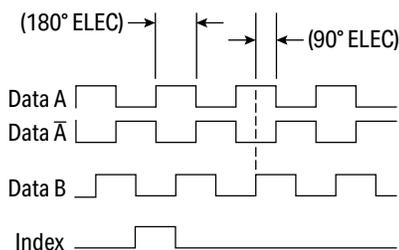
Shaft Size: 10mm, 3/8"
Shaft Speed: 6000 RPM, maximum
Shaft Loading: Up to 100 lbs axial and radial
Starting Torque: 2.5 in-oz. maximum (at 25°C)
Bearings: 5200 ZZ double row
Bearing Life: 5 x 108 revs at rated shaft Loading, 5 x 1011 revs at 10% of rated shaft loading. (manufacturers' specs)
Housing and Cover: Hard Anodized Aluminum. Also available in Electroless Nickel finish and Stainless Steel.
Shaft Material: 303 stainless steel (passivated)
Disc Material: Aluminum
Weight: 14 ounces, typical

ENVIRONMENTAL

Operating Temperature: -40 to 80°C
Storage Temperature: -40 to 100°C
Shock: 50G's for 11msec duration
Vibration: 5 to 2000Hz @ 20 G's
Humidity: Up to 98% (non-condensing)
Enclosure Rating: IP67

STANDARD DATA AND INDEX

Not all complements shown
 A̅ shown for reference



Index Width: 180° Default
 A leads B, CCW (from shaft end)

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ORDERING INFORMATION

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Shaft	Code 4: Electrical	Code 5: Termination	Code 6: Options
HD20 <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HD20 Hazardous Duty Encoder 1 Unidirectional (A Channel) 2 Bidirectional (A and B Channels) 3 Bidirectional with Index (A, B, Z Channels) Note: See code 4 column for addition of differential complementary channels	Enter Custom PPR from 0001 to 9000 Examples: 0001 = 1 PPR 0256 = 256 PPR 1024 = 1024 PPR 8192 = 8192 PPR 9000 = 9000 PPR	0 3/8" Dia. Shaft with flat 4 10mm Dia. Shaft, no flat	0 Open Collector out (7273) 2 Push-Pull out (7272) F Open Collector out (2222) G Open Collector out with 2.2 kΩ Pullups (2222) Available when: Code 1 is 1,2 and Code 5 is 3 through H, or Code 1 is 3 and Code 5 is 5 through H: 3 Differential Line Driver out (7272) Available ATEX Certified Options ATEX Type 1: ATEX Certified; 5V in, 5V out only ATEX Type 2: ATEX Certified; 7-26V in, 7-26V out ATEX Type 3: ATEX Certified; 7-26V in, 5V out	1 6 Pin Connector 3 7 Pin Connector 5 10 Pin Connector D 18" Sealed Cable E 3' Sealed Cable F 6' Sealed Cable G 10' Sealed Cable H 15' Sealed Cable	Available when Code 4 is 0, 2, F, G, 3 A Standard Housing with ATEX Type 1 B Nickel Finish Housing with ATEX Type 1 C Stainless Steel Housing with ATEX Type 1 G Same as "A" with ATEX Type 2 H Same as "B" with ATEX Type 2 I Same as "C" with ATEX Type 2 Available when Code 4 is 0, 2 D Redundant Outputs (Dual Connector Housing) with ATEX Type 1† E Nickel Finish Housing, Redundant Outputs with ATEX Type 1† F Stainless Steel Housing, Redundant Outputs with ATEX Type 1† J Same as "D" with ATEX Type 2† K Same as "E" with ATEX Type 2† L Same as "F" with ATEX Type 2† Available when Code 4 is 2 or 3 M Same as "A" with ATEX Type 3 N Same as "B" with ATEX Type 3 O Same as "C" with ATEX Type 3 P Same as "D" with ATEX Type 3† Q Same as "E" with ATEX Type 3† R Same as "F" with ATEX Type 3† † Simultaneous use of redundant outputs will void ATEX certification and is not allowed. Consult factory for details.

ACCESSORIES

Cable Assemblies with MS Connector			
SKU	Pins		Use with...
108594-XXXX	6 Pin MS	Connector, Cable Assembly	single ended outputs
108595-XXXX	7 Pin MS		single ended outputs
108596-XXXX	7 Pin MS		differential line driver without index outputs
1400635XXXX	10 Pin MS		differential line driver with index outputs
109209-XXXX	NEMA4 10 pin MS		differential line driver with Index outputs

Mating Connectors (no cable)		
SKU	Pins	Style
MCN-N4	6 pin	MS3106A-14S-6S
MCN-N5	7 pin	MS3106A-16S-1S
MCN-N6	10 pin	MS3106A-18-1S
MCN-N6N4	10 pin	NEMA4

Note: Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace XXXX with -0020.

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ELECTRICAL CONNECTIONS

6, 7 AND 10 PIN MS CONNECTORS AND CABLES—WHEN CODE 5 = 1, 3, 5, OR D-P

Connector and mate/accessory cable assembly pin numbers and wire color information is provided here for reference. Models with direct cable exit carry the color coding as shown in the right hand column.

Table 1									
Encoder Function	Cable # 108594-XXXX 6 Pin Single Ended		Cable # 108595-XXXX 7 Pin Single Ended		Cable # 108596-XXXX 7 Pin Diff Line Driver without Index		Cable # 109209-XXXX* or 1400635XXXX 10 Pin Diff Line Driver with Index		Cable Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Signal A	E	BRN	A	BRN	A	BRN	A	BRN	GRN
Signal B	D	ORG	B	ORG	B	ORG	B	ORG	BLU
Signal Z [†]	C	YEL	C	YEL	—	—	C	YEL	ORG
Power +V	B	RED	D	RED	D	RED	D	RED	RED
Common	A	BLK	F	BLK	F	BLK	F	BLK	BLK
Case	—	—	—	—	—	—	—	—	—
N/C	F	—	E	—	—	E	E	—	—
Signal \bar{A}	—	—	—	—	C	BRN/WHT	H	BRN/WHT	VIO
Signal \bar{B}	—	—	—	—	E	ORG/WHT	I	ORG/WHT	BRN
Signal \bar{Z} [†]	—	—	—	—	—	—	J	YEL/WHT	YEL

Notes:

Cable Configuration (Table 1): PVC jacket, 105°C rated, overall foil shield; 3 twisted pairs 24 AWG (output signals), plus 2 twisted pairs 22 AWG (input power)

Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020

MS[®] Type mating connectors and pre-build cables are rated NEMA 12

*For watertight applications, use NEMA4 10 pin cable and connector 109209-XXXX

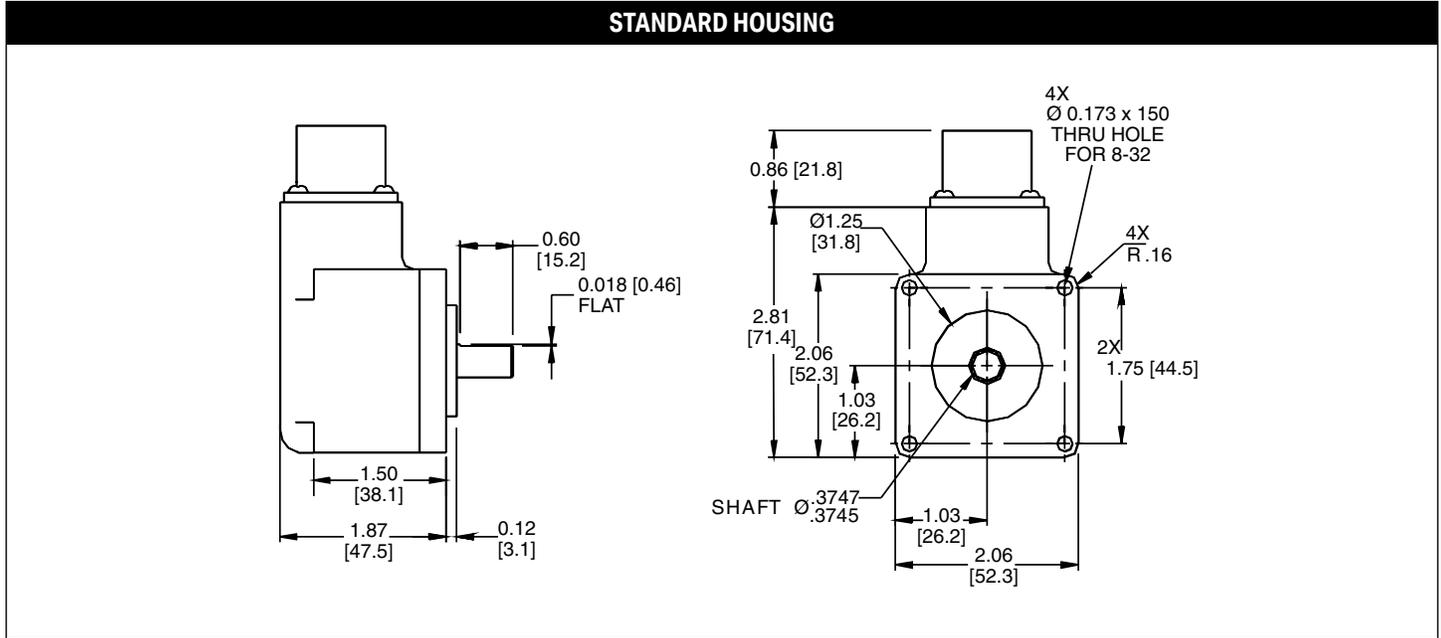
[†] Index not provided on all models. See ordering information

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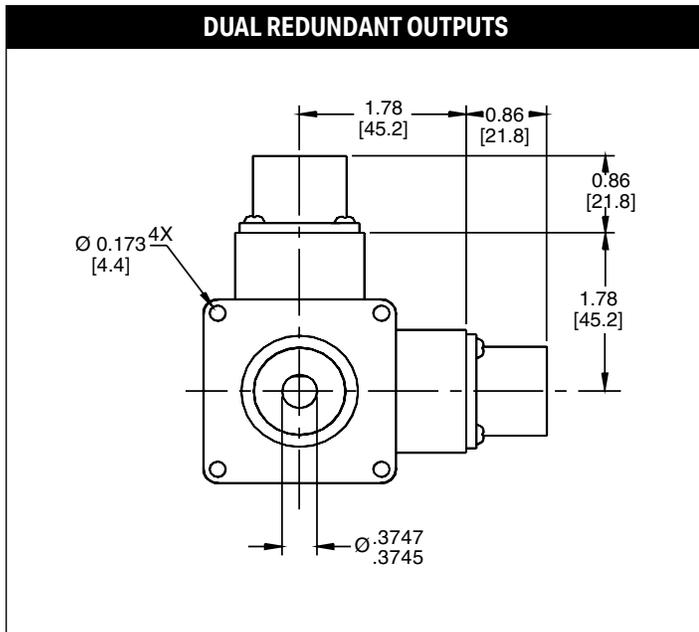
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Dimensions: inch [mm]

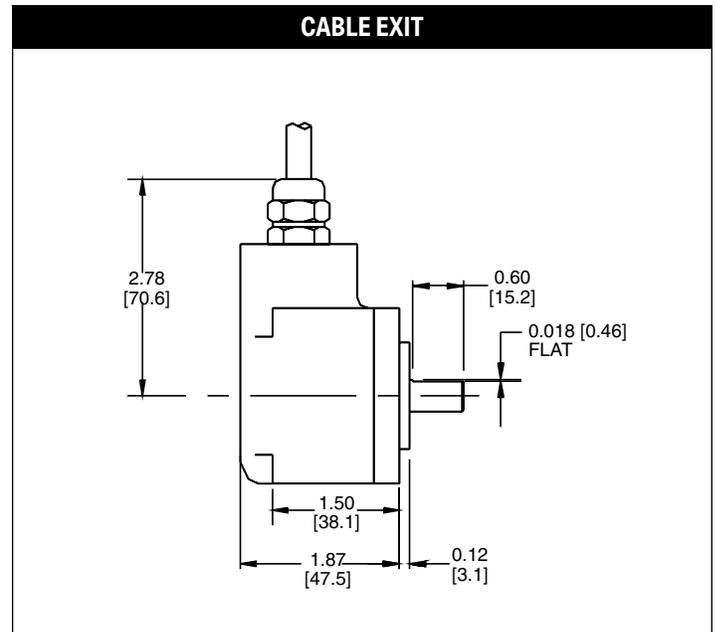
STANDARD HOUSING



DUAL REDUNDANT OUTPUTS



CABLE EXIT



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